Book review

Advances in Twin and Sib-pair
Analysis

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Greenwich Medical Media: London,
2000, 26 pp, £24.50
ISBN 1 841 100 048

In 1998, an impressive group of sailors, old salts as well as greenhorns, gathered in Cambridge to exchange toasts and their experience in making their way through the seas of genetic epidemiology, full of exotic new fruit and dangerous cliffs alike. Those seasoned travellers, who served as guides in this remarkable gathering, were tricked by the hosts into writing down their speeches which resulted in this book.

Before reporting my personal opinion about this volume, I must disclose a potential bias. Having been at the workshop for two years running, I cannot help but feel the spirit of the meetings in every single chapter: Eventually, I feel this strange longing for a pint of lager.

In the times of online journals, one might question the value of a printed book, and indeed all the information compiled in the 19 chapters may be found elsewhere. However, at a closer look this feature is precisely the book's main value. Hundreds of articles in dozens of journals deal with the topic of twin and sib-pair analysis. Oftentimes, the title does not reveal the fact that essential new information is hidden somewhere in the methods section. Instead of reading all these articles and being forced to put them into perspective (who is ever going to do so anyway?), monographs written by experts may serve as an introduction as well as a reference. The chapters of this volume put many pieces of the puzzle together and reveal a picture.

Now what parts of the picture are the focus of the book? Quite logically the first chapter is devoted to the history of twin and sib-pair studies, as it is easier to find the way and appreciate the progress if you know where the voyage began. In addition, the chapter fills the reader with hope and confidence, helping him to hold on while reading the following chapters which deal with the many cliffs and other obstacles along the way. These cliffs begin as early as in the design of a study (chapter 2) and may be hidden in sample selection and outcome definitions (chapter 3). The next chapter is devoted to practical approaches to account for bias and other confounders. Here, a great deal of theory is necessarily involved.

Chapter 5 deals with a special design, the co-twin control study, and examines its value in the context of gene–environmental interaction. The following chapters address very fundamental points of concern regarding twin studies, namely the generalisability and assumptions of twin studies, as well as the challenging question of foetal programming vs genes. For these two chapters, the logical position might have been immediately after the history, given their importance.

Chapter 8 explores the possibilities and advantages of twin and sib-pair studies in developing countries, which go well beyond cost-effectiveness. The growing interest in genetic diversity in the post genome project era is likely to put even more emphasis on this important field of study.

Chapters 9 to 11 take the reader for a dive into the deep waters of statistics by comparing ANOVA and likelihood-based methods for twin data analysis introducing the path analysis of age-related traits and survival analysis. The authors periodically have quite different approaches and options; however, they manage to give the reader sufficient information to go back to their own data and to make their judgements. Unfortunately, the book cannot fully reproduce the fruitful spirited discussions that were spawned by these topics.

Twin studies may seen to be directed solely at genetic influences. Nevertheless, chapters 12 and 13 put the environment back into the picture by addressing gene–environmental interactions and the 'uncommon' common environmental effects.

The word 'advances' in the title of the book would not be justified if molecular genetic analyses in twins were not included. Chapter 13 is devoted to tests for allelic association, introducing many of the terms used in the following chapters dealing with power issues, the use of twins in quantitative trait locus mapping, and the implementation of such analyses in Mx. Over just the last few years, this fascinating approach to human genetics has developed and produced valuable new results in behavioral as well as medical genetics in parallel. By charting some peaks rising high above the ground, the twin model gave substantiated hope than an entire continent is waiting for us to be explored in the future. And while we must accept the fact that nature is probably too complex to ever be fully understood, we are privileged to work in a time when the tools required for our daring journey into molecular genetics of complex traits are increasingly available.

The final chapter deals with the field of pharmacogenetics, a topic fuelling dreams of new approaches to the treatment of disease, particularly in terms of predicting effects and side effects. There is a great potential in this field for important new findings and funding for this area of research is available as well.

Overall, the organisers of the Cambridge workshop and editors of this monograph did a great service to the field of human genetics in bringing together such a well-chosen group of experts, and providing us with this valuable compilation of their views. The book is a definite must for anyone planning or conducting twin and sib-pair studies. The book is highly recommended for epidemiologists, molecular biologists, and human geneticists, be they experienced scientists or newcomers to the field. All readers of this journal should have the volume on their desks.

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